CLAIMS:

1. A sub-harmonic mixer, comprising:

first and second field effect transistors, each having a gate, a source and a drain, the drains being coupled together,

signal generating means for generating first and second local oscillator signals substantially in anti-phase with each other, said signal generating means being arranged to feed said first local oscillator signal to the source of said first field effect transistor and the second local oscillator signal to the source of said second field effect transistor,

an input means coupled to said drains for receiving an input signal for the mixer, and

an output means coupled to said drains for outputting an output signal from the mixer.

2. A sub-harmonic mixer as claimed in claim 1, further comprising input signal coupling means for coupling the source of each of said first and second field effect transistors to ground at the frequency of the input signal.

3. A sub-harmonic mixer as claimed in claim 1, further comprising output signal coupling means for coupling the source of each of said first and second field effect transistors to ground at the frequency of the output signal.

4. A sub-harmonic mixer as claimed in claim 1, further comprising DC coupling means for coupling the source of each of said first and second transistors to DC ground.

5. A sub-harmonic mixer as claimed in claim 1, further comprising LO coupling means for coupling the gate of each of

said first and second field effect transistors to ground at the frequency of said local oscillator signal.

6. A sub-harmonic mixer as claimed in claim 1, further comprising biasing means for biasing the gate of each of said first and second field effect transistors at a bias voltage such that each of said first and second field effect transistors operate in pinch-off mode.

7. A sub-harmonic mixer as claimed in claim 6, further comprising gate signal filter means for substantially preventing signals having frequencies of any of the said local oscillator signal, said input signal and said output signal passing from a respective gate to said biasing means.

8. A sub-harmonic mixer as claimed in claim 7, wherein said gate signal filter means comprises a choke.

9. A sub-harmonic mixer as claimed in claim 1, further comprising DC coupling means for coupling the drains of each of said first and second field effect transistors to DC ground.

10. A sub-harmonic mixer as claimed in claim 9, further comprising filter means for substantially preventing said input signal and said output signal passing through said DC coupling means.

11. A sub-harmonic mixer as claimed in claim 1, further comprising RF filter means connected to said drains for passing signals having frequencies within a first frequency band above the frequency of said local oscillator signal.

12. A sub-harmonic mixer as claimed in claim 1, further comprising a filter connected to the drains for passing frequencies within a frequency band below the frequency of said local oscillator signal.

13. A sub-harmonic mixer as claimed in claim 1, wherein said signal generating means comprises a local oscillator for generating a local oscillator signal and a signal splitter for dividing said signal into said first and second local oscillator signals.

14. A sub-harmonic as claimed in claim 13, wherein said signal splitter comprises one of a hybrid and a balun.

15. A sub-harmonic mixer, comprising:

first and second field effect transistors, each having a gate, a source and a drain, the sources being connected together,

signal generating means for generating first and second local oscillator signals substantially in anti-phase with each other, said signal generating means being arranged to feed said first local oscillator signal to the drain of the first field effect transistor and the second local oscillator signal to the drain of the second field effect transistor,

input means coupled to said sources for receiving an input signal for the mixer, and output means coupled to said sources for outputting an output signal from the mixer.